



が、通信回路を介して受信され、故障判定データが解析されて故障原因が特定され、故障原因に対応する修理を行うための手配がされる。

【0011】  
【発明の実施の形態】図1は本発明の修理作業手配装置を応用した故障原因解析システムの一実施例の構成を示すブロック図である。

【0012】家庭Hに設置された家電機器（ビデオカメラ1、パーソナルコンピュータ2、TV（テレビジョン）受像器3、及び冷蔵庫4）は、必要に応じてホームバス6と電話回路7を介してセンサSに設置された故障判定装置5に接続することができるようになされている。すなわち、例えば、家庭Hに設置されたビデオカメラ1に故障が発生した場合、家庭Hのユーザがビデオカメラ1をホームバス6に接続するようにする。

【0013】その結果、ビデオカメラ1とセンサSの故障判定装置5との間で、所定のデータが相互に授受され、自動的に、ビデオカメラ1の故障原因が特定され、修理に必要な部品が手配されたり、修理作業を行う保守員の業務計画が調整されるようになされている。

【0014】同様に、他の家電機器（パーソナルコンピュータ2、テレビジョン受像器3、及び冷蔵庫4）に故障が発生した場合は、家庭Hのユーザが、故障が発生した所定の家電機器をホームバス6に接続し、センサSの故障判定装置5と所定の家電機器との間で相互に所定のデータを授受できるようにする。なお、家庭Hでの設置場所が頻りに変更されないような家電機器、例えば、TV受像器3や冷蔵庫4などは、予めホームバス6に接続しておくようにしてもよい。

【0015】所定の故障体の映像は、ビデオカメラ1のレンズ11と、その光学系を変更する調整回路12を介して、CCDカメラ13に入力されるようになされている。CCDカメラ13は、故障体の映像に対応する映像信号を生成し、信号処理回路15に供給するようになされている。

【0016】信号処理回路15は、CCDカメラ13より供給された映像信号に、所定の信号処理を施し、出力回路16を介して図示せぬVCR（Video Cassette Recorder）などの記録装置に出力するようになされている。

【0017】マイクロコンピュータ14は、ビデオカメラ1の各種の制御、例えば、調整回路12に対し、被写体に対応する光学系を変更する調整回路12に対し、所定の信号処理を指示するなどの制御を行うようになっている。また、ビデオカメラ1の不良の動作を検知し、この検知結果を基に、故障原因を特定するための故障解析データを生成し、信号処理回路15を通じて、所定の信号処理を指示するなどの制御を行うようになっている。さらに、送受信回路17と信号処理回路15を介してホームバス6から入力される故障診断プログラムを実行したり、その結果、生成される故障判定データ

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を信号処理回路15と送受信回路17を介してホームバス6に出力するようになされている。さらにまた、送受信回路17と信号処理回路15を介してホームバス6から入力される所定のメッセージや故障情報（故障内容、修理方法、修理所用時間、および修理費用などの情報）を液晶表示装置18に表示させるようになされている。

【0018】これらのデータ（故障解析データ、故障診断プログラム、故障判定データ、メッセージ、および故障情報）は、ホームバス6と電話回路7を介して、ビデオカメラ1とセンサSの故障判定装置5とで、授受されるようになされている。

【0019】ビデオカメラ1より伝送された故障解析データまたは故障判定データは、故障判定装置5の送受信回路23で受信され、故障箇所判定回路22に供給されるようになされている。

【0020】故障箇所判定装置22は、故障解析データまたは故障判定データを解析処理し、その結果をマイクロコンピュータ24に供給するようになされている。

【0021】マイクロコンピュータ24は、この解析結果をCRT21に表示させるようになされている。また、解析結果に応じて、より詳細な情報を取得するための故障判定プログラムに関連情報DB（データベース）25より読み出し、マイクロコンピュータ24、故障箇所判定装置22、送受信回路23、電話回路7、およびホームバス6を介して、ビデオカメラ1に伝送するようになされている。さらに、関連情報DB25に登録された故障情報の中から、故障箇所判定回路22より供給された故障原因の解析結果に対応する故障情報を読み出し、ビデオカメラ1に伝送するようになされている。さらに

また、故障原因の解析結果を基に、商品の在庫管理を行うとともに、修理を行う保守員の業務計画を生成するようにもなされている。

【0022】なお、家庭Hに設置されたビデオカメラ1以外の家電機器と、故障判定装置5との間でも、ビデオカメラ1の動きと同様に、所定の故障解析データ、故障判定データ、故障箇所判定プログラム、メッセージ、または故障情報が授受されるようになされている。

【0023】また、家庭HとセンサSとの通信手段としては、電話回路の他、光ファイバケーブルなどの有線とすることもできる。また、移動体通信回路などの無線とすることもできる。

【0024】次に、図1の故障原因解析システムの処理動作について、図2と図3のフローチャートを参照して説明する。

【0025】今、図1のビデオカメラ1に故障が発生し、ユーザがビデオカメラ1をホームバス6に接続したものとすると、図2のステップS1で、ビデオカメラ1のマイクロコンピュータ14は、ビデオカメラ1の動作不良を検知し、検知結果を基に、所定の制御プログラムのサブデータなどより構成される動作不良の状態

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を検出した故障解析データを生成し、信号処理回路15、送受信回路17、ホームバス6、および電話回路7を介してセンサSの故障判定装置5に送受信する。この故障解析データは、故障判定装置5の送受信回路23で受信され、故障箇所判定回路22に供給される。その後、故障解析データは、故障箇所判定回路22で解析され、解析結果がマイクロコンピュータ24を介してCRT21に表示される。

【0026】続くステップS2で、マイクロコンピュータ24は、故障原因のより詳細な情報を得るために、故障箇所判定装置22から供給された解析結果に対応する、関連情報DBに登録されている所定の故障診断プログラムを読み出し、ビデオカメラ1に送信する。ビデオカメラ1の送受信回路15は、故障診断プログラムを受信し、信号処理回路17は、マイクロコンピュータ14に供給する。そして、マイクロコンピュータ14は、故障診断プログラムを実行し、故障判定データを生成する。

【0027】続いて、ステップS3で、マイクロコンピュータ14は、信号処理回路15と送受信回路17を介して、故障判定データをホームバス6に出力する。故障解析データは、ホームバス6と電話回路7を介して故障判定装置5の送受信回路23で受信され、故障箇所判定回路22に供給される。

【0028】次に、ステップS4で、故障箇所判定回路22は、故障判定データを解析し、解析結果をマイクロコンピュータ24に供給する。そして、この解析結果は、マイクロコンピュータ24で対応する映像信号に変換され、CRT21に表示される。

【0029】後続のステップS5で、マイクロコンピュータ24は、解析結果と関連情報DB25に登録された情報を基に、故障した家電機器（ビデオカメラ1）が修理可能であるか否かを判断する。ステップS5で修理不可能であると判断された場合、ステップS6で、マイクロコンピュータ24は、修理が不可能であることを示す所定のメッセージをビデオカメラ1に伝送する。このメッセージはビデオカメラ1の送受信回路17で受信され、信号処理回路15とマイクロコンピュータ14を介して液晶表示装置18に表示される。

【0030】このようにして、家庭Hのユーザは、ビデオカメラ1の故障が修理可能であるか否かを知ることができ、なお、ステップS6では、修理不可能であることを示すメッセージの他、故障箇所や原因などの故障原因の説明を加えたメッセージを送信することもできる。

【0031】ステップS5で修理可能であると判断された場合、ステップS7で、マイクロコンピュータ24は、ユーザによる修理が可能であるか否かを判断する。ステップS7でユーザによる修理が可能であると判断された場合、ステップS8で、マイクロコンピュータ24は、関連情報DB25より、対応する修理方法を検索し

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てビデオカメラ1に送信する。そして、この修理方法がビデオカメラ1の液晶表示装置18に表示される。

【0032】このようにして、家庭Hのユーザは、ビデオカメラ1の故障が自分で修理可能である場合、その修理方法を知ることができる。

【0033】ステップS7でユーザによる修理が不可能であると判断された場合、ステップS9で、マイクロコンピュータ24は、関連情報DB25より、修理費や修理時間などの故障情報を検索し、ビデオカメラ1に伝送する。この故障情報は、ビデオカメラ1の液晶表示装置18に表示される。家庭Hのユーザは、液晶表示装置18に表示された故障情報を参照して、修理を行うか否かの修理意志を決定し、ビデオカメラ1の具備する図示せぬ所定のテンキーやボタンの操作により、修理意志を故障判定装置5に伝送する。

【0034】続くステップS10で、修理意志の情報が故障判定装置5に伝送され、CRT21に表示される。

【0035】後続のステップS11で、マイクロコンピュータ24は、伝送されてきた修理意志の情報を基に、ユーザが修理を希望しているか否かを判断する。修理を希望していないと判断された場合、図2に示すフローチャートの処理は終了するが、ユーザが修理を希望していると判断された場合、ステップS12のサブルーチン処理（修理準備処理）が実行される。

【0036】ここで、図2のステップS12の処理の詳細について、図3のフローチャートを参照して説明する。

【0037】図3のステップS21で、マイクロコンピュータ24は、故障箇所判定装置22から供給された解析結果を基に、関連情報DB25を検索して、ビデオカメラ1の修理に必要な所定の部品を決定する。

【0038】続くステップS22で、修理に必要な部品の在庫があるか否かが判断される。修理に必要な部品の在庫があると判断された場合、ステップS27に分岐するが、修理に必要な部品の在庫がないと判断された場合、ステップS23で、マイクロコンピュータ24は、所定の商品の購入計画に従い、部品センサに登録する部品（修理に必要な部品）の数量を決定する。

【0039】そして、ステップS24で、部品センサへの発注がおこなわれ、ステップS25で、マイクロコンピュータ24は、発注部リストを発注内容に従い更新する。続いて、ステップS26で、発注部品が入荷されると、ステップS27に分岐し、ステップS27で、マイクロコンピュータ24は、部品在庫リストを更新する。

【0040】このようにして、所定の部品の購入計画に従い、修理に必要な部品の在庫を、自動的に管理するようにする。

【0041】後続のステップS28で、マイクロコンピュータ24は、故障の種類、修理履歴量、修理に要する

作業時間、部品在庫情報、および部品入荷時期情報など、作業に関する詳細な故障修理作業風性を関連情報DB 25より検索する。

【0042】次に、ステップS29で、関連情報DB25に格納された保守員の人事情報（各保守員の有する特殊技能や作業速度などの情報）を基に、各保守員毎に、修理に要する修理時間が推定され、ステップS30で、関連情報DB25に格納された保守員の業務計画を基に、ビテオカメラ1の修理を行うのに最速な保守員が選出される。

【0043】 続くステップS31で、マイクコンピュ  
ータ24は、ステップS30で選出した保守員の業務計  
画を更新する。

【0044】このようにして、図3のフローチャートに示す修理準備処理が終了すると、図2のステップ13に分支し、退出された保守員が業務計画に従い、在庫管理された修理に必要な部品を使用して所定の家電機器（ビデオカメラ）の修理を行う。

【00045】このようにして、通信回線を介して、事前に、故障が発生した家電機器の故障箇所を特定し、修理に必要な部品の在庫管理を行うとともに、所定の修理内容に最適な修理担当者を選出することができる。

【0046】図4は、本発明の修理作業手配装置を応用した故障原因解析システムの他の実施例の構成を示すブロック図である。図4の故障原因解析システムにおいて、図1の場合と対応する部分には、同一の符号を付しており、その説明は適宜省略する。

【0047】図4に示す故障原因解析システムは、図1に示す家庭Hに設置された各家電機器が通信情報を有しない場合の構成例であり、センサSに設置された故障判定装置5との通信を、故障診断通信装置3.2のみが行うようにした例である。

【0048】家庭用設置された各気体電線(31-1乃至31-n)は、必要に応じてホームバス6に接続することができる。ホームバス6を介して故障診断通信装置32に接続することができるようになされている。

4)は、家電機器31-1の各種の動作を行うとともに、家電機器31-1の本質的な動作を行う処理回路42の不具合の動作を検知し、この検知結果を基に所定の故障診断プログラムを生成するようになされている。また、故障診断プログラムを生成するようになされている。また、故障診断回路装置22から、ホームバス6と、信号処理回路4を介して信号処理回路43に入力され、信号処理回路43で所定の処理が施された故障診断プログラムをデータバス7で所定の処理が施された故障判定データ4を生成したり、信号処理回路43、3の入出力回路44、およびホームバス6を介して故障診断装置32に、故障診断プログラムや故障判定データを送り出すようになされている。

【0050】なお、図示は省略するが、他の家電機器

(31-2乃至31-n)も、家電機器31-1と同様に構成されている。

【005】故障診断通信回路のインタコンビニュータ51は、ホーバス6と入出力回路5.3を介して信号処理回路5.2に入力され、信号処理回路5.2で所定の処理が施された故障解析データや故障判定データに、故障判定装置5のネットワークアドレスを付したり、電話回線7に対応する宛向を行い、信号処理回路5.2、送受信号回路5.4、および電話回線7を介して故障判定装置5.2に出力するようになされている。また、電話回線7、送受信号回路5.4、および信号処理回路5.3を介して受信される故障診断プログラムを、信号処理回路5.2、入出力回路5.3、およびホーバス6を介して、所定の家内機器3-1-1乃至3-1-nに転送するようになされている。さらに、故障判定装置5から伝送される所定の故障情報やメッセージを、CRT5.5に表示するようになされている。

【0052】図4の故障原因解析システムの処理動作は、図2と図3のフローチャートに示す処理と同様の処理であるので、その説明は省略する。

【0051】なお、故障診断通信装置32は、通信機能のみを有するとしたが、簡単な故障診断を行うようにしてもよい、その場合、家電機器31-1乃至31-nのいずれの故障が発生したとき、マイクロコンピュータ51の有する所定のRAMより、簡単な故障診断プログラムを読み出して所定の家電機器31-1乃至31-nに実行させる。その結果（故障判定データ）を解析し、解析結果を、故障判定装置5に伝送するようにする。その後、さらに詳細な故障判定データを取得するための故障診断プログラムを、故障判定装置5から故障診断通信装置32を介して所定の家電機器31-1乃至31-nに伝送して、実行させる。その実行結果（故障判定データ）を故障診断通信装置32を介して、故障判定装置5に伝送するようにする。

【0054】このようにして、センタSに設置された故障判定装置5より、所定の故障診断プログラムを転送し、故障が発生した家電機器31-1乃至31-nで実行させ、さらに故障判定データをセンタSに転送させて解析し、修理に必要な部品の在庫管理を行ったり、保守の業務計画を作成することができ、

【0055】従って、故障した家電機器の修理を行う保守員は、事前に、故障が発生した家電機器31-1乃至31-nの故障箇所を知ることができるため、既に用意された部品を使用して、迅速な修理作業を行うことができる。

【0056】また、修理の内容と保守員の業務計画を基に、所定の保守員が選ばれるため、無理のない業務計画で最適な保守員が修理作業を行うことができる。

【10057】さらに、自動的に、修理に必要な部品の在庫管理がなされるため、所定の部品購入計画に基づき、

効率よく、セントSに修理に必要な部品を常備させておくことができる。

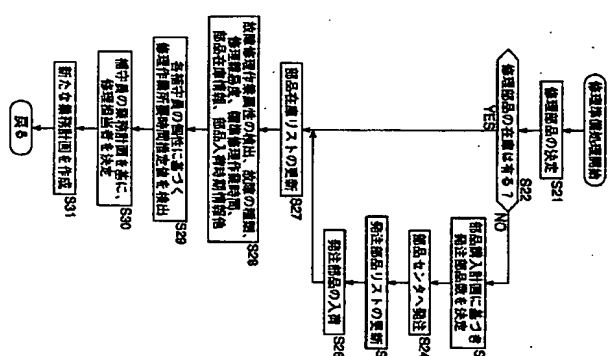
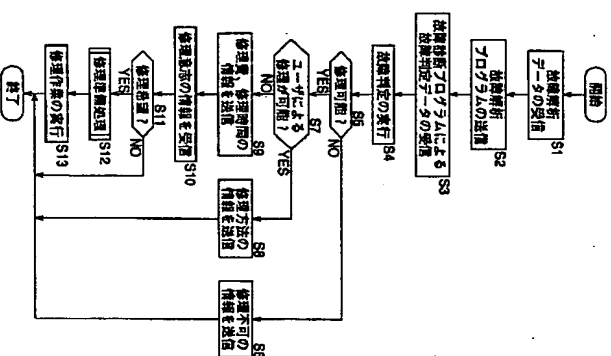
【0058】さらにまた、ユーザには、故障した家電機器31-1乃至31-nの診断結果として、修理費用や修理に要する時間などを、故障内容の簡単な説明とともに送信することができるため、ユーザは、これを参照して修理を行うか否かを選択することができる。

【0059】なお、上述の実施例においては、故障判定装置5のマイクロコンピュータ24が、自動的に品物の在庫管理や保守員の業務管理を行うとしたが、センサSの監視員が、必要に応じて、これらの指示をマイクロコンピュータ24に指示するようにしてもよい。

【期待の効果】以上のように請求項1に記載の修理作業を手配し、設置および請求項5に記載の修理作業手配方法によれば、故障原因を解析するための故障診断プログラムを、有線または無線の所定の通信回線を通して転送し、故障診断プログラムが実行されることにより生成される故障原因データベースを受信し、解析して故障原因を特定し、故障原因に対応する修理を行うための指示を行うようにしたので、修理作業に要する人権費を削減することができるとともに、迅速な修理作業を行うことができる。

【図面の簡単な説明】

【図1】本発明の修理作業手配装置を応用した故障原因



解析システムの一実施例の構成を示すブロック図である。

【図2】図1の故障原因解析システムの処理動作を説明するフローチャートである。

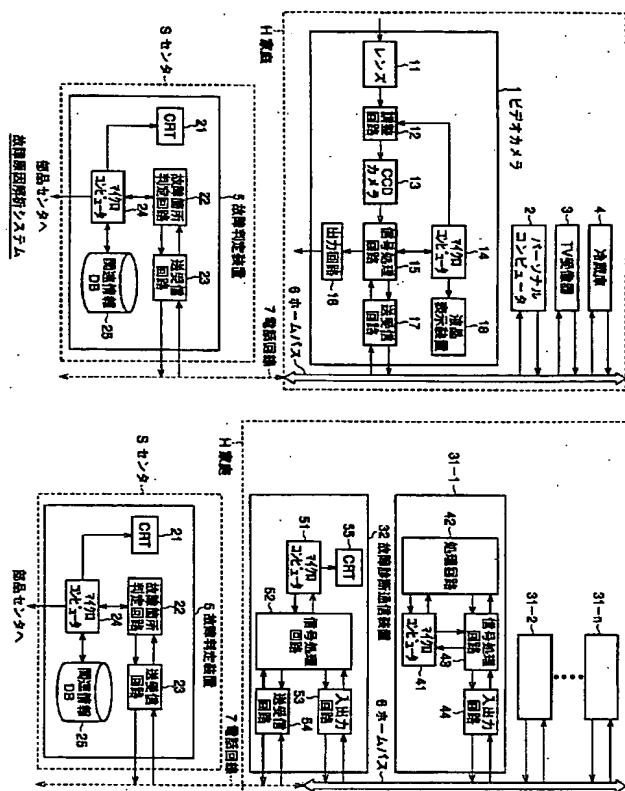
【図3】図2のステップS12のサブルーチン処理のフローチャートである。

【図4】本発明の修理作業手配装置を応用した他の故障原因解析システムの一例の構成を示すブロック図である。

【符号の説明】

1 ビデオカメラ、 2 パーナルコンピュータ、  
3 TV受像器、 4 冷蔵庫、 5 故障判定装置、  
6 ホームバス、 7 電話回線、 11 レンズ、 1  
2 調整回路、 13 CCDカメラ、 14 マイクロ  
コンピュータ、 15 信号処理回路、 16 出力  
回路、 17 送受信回路、 18 液晶表示装置、 2  
1 CRT、 22 故障箇所判定回路、 23 送受  
信回路、 24 マイクロコンピュータ、 25 開通  
情報DB、 31-1乃至31-n 家電機器、 32  
故障診断通信装置、 41 マイクロコンピュータ、  
42 処理回路、 43 信号処理回路、 44 入力  
出力回路、 51 マイクロコンピュータ、 52 信号  
処理回路、 53 入力回路、 54 送受信回路、

**【例4】**



English Translation of  
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(71)Applicant : SONY CORP  
(72)Inventor : KONDO TETSUJIRO, FUJIMORI YASUHIRO  
(64) DEVICE AND METHOD FOR ARRANGING REPAIR WORK

\* NOTICES \*

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1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. \*\*\*\* shows the word which can not be translated.

3. In the drawings, any words are not translated.

CLAIMS

[Claim(e)]

[Claim 1] A transfer means to transmit the electric fault finding for analyzing a cause of fault through the predetermined communication line of a cable or wireless. A receiving means to receive the failure judging data for specifying the detailed cause of fault generated by performing said electric fault finding through said communication line, Repair dispatching equipment characterized by having a specific means to analyze said failure judging data and to specify a cause of fault, and an arrangements means to arrange for performing repair corresponding to said cause of fault.

[Claim 2] Said arrangements means is repair dispatching equipment according to claim 1 characterized by transmitting the contents of said repair through said communication line, receiving the input of the decision of whether to perform said repair, and carrying out said arrangements corresponding to said decision.

[Claim 3] Said arrangements means is repair dispatching equipment according to claim 1 characterized by electing the customer engineer which performs said repair and drawing up business planning of said customer engineer.

[Claim 4] Said arrangements means is repair dispatching equipment according to claim 1 characterized by managing an inventory of predetermined components required for said repair.

[Claim 5] The step which transmits the electric fault finding for analyzing a cause of fault through the predetermined communication line of a cable or wireless, The step which receives the failure judging data for specifying the detailed cause of fault generated by performing said electric fault finding through said communication line, The repair dispatching approach characterized by having the step which analyzes said failure judging data and specifies a cause of fault, and the step arranged for performing repair corresponding to said cause of fault.

## DETAILED DESCRIPTION

### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the repair dispatching equipment and the approach which were made to arrange especially about repair dispatching equipment and an approach for performing repair which transmits predetermined electric fault finding, analyzes the failure judging data generated by performing electric fault finding, specifies a cause of fault, and corresponds.

[0002]

[Description of the Prior Art] Usually, when fixing electronic equipment equipments, such as broken home electronics, he carries in the home electronics which broke down at the repair windows, such as a predetermined service center, or is trying to request business trip repair from a manufacturer.

[0003] And after a repair person in charge investigates the home electronics and pinpoints a failure part, correspondence of ordering replacement parts is performed if needed.

[0004]

[Problem(a) to be Solved by the Invention] However, in the conventional repair, in order to conduct unnecessary investigation, for example, investigation of normal components etc., originally since the home electronics with which the repair person in charge broke down are investigated based on little information acquired from the user (user of a household electric appliances device), and to pinpoint a failure part, the technical problem which requires excessive time amount occurred.

[0005] Moreover, by investigating the home electronics with which the repair person in charge broke down, since a defect's components are specified, components required for repair cannot be prepared in advance. While it follows, for example, the repair person in charge is not bringing components required for repair in business trip repair, it is necessary to bring required components again and to go to a user's home. Consequently, while human rights expense became great, the technical problem with it difficult to perform repair quickly occurred.

[0006] This invention is made in view of such a situation, pinpoints a failure part and enables it to arrange in advance the customer engineer which performs components required for repair, and repair by performing predetermined electric fault finding.

[0007]

[Means for Solving the Problem] A transfer means to transmit electric fault finding for repair dispatching equipment according to claim 1 to analyze a cause of fault through the predetermined communication line of a cable or wireless. A receiving means to receive the failure judging data for specifying the detailed cause of fault generated by performing electric fault finding through a communication line. It is characterized by having a specific means to analyze failure judging data and to specify a cause of fault, and an arrangements means to arrange for performing repair corresponding to a cause of fault.

[0008] The step which transmits electric fault finding for the repair dispatching approach according to claim 5 to analyze a cause of fault through the predetermined communication line of a cable or wireless. The step which receives the failure judging data for specifying the detailed cause of fault generated by performing electric fault finding through a communication line. It is characterized by having the step which analyzes failure judging data and specifies a cause of fault, and the step arranged for performing repair corresponding to a cause of fault.

[0009] In repair dispatching equipment according to claim 1 A transfer means transmits the electric fault finding for analyzing a cause of fault through the predetermined communication line of a cable or wireless. A receiving means the failure judging data for specifying the detailed cause of fault generated by performing electric fault finding. It receives through a communication line, and a specific means analyzes failure judging data, a cause of fault is specified, and an arrangements means arranges for performing repair corresponding to a cause of fault.

[0010] In the repair dispatching approach according to claim 5, the electric fault finding for analyzing a cause of fault is transmitted through the predetermined communication line of a cable or wireless, the failure judging data for specifying the detailed cause of fault generated by performing electric fault finding are received through a communication line, failure judging data are analyzed, a cause of fault is specified, and arrangements for performing repair corresponding to a cause of fault are carried out.

[0011]

[Embodiment of the Invention] Drawing 1 is the block diagram showing the configuration of one example of the cause-of-fault analysis system adapting the repair dispatching equipment of this invention.

[0012] The household-electric-appliances device (a video camera 1, a personal computer 2, TV (television) television machine 3, and refrigerator 4) installed in Home H is made as [connect / with the failure judging equipment 5 installed in Center S through a home bus 6 and the telephone line 7 / it, if needed]. That is, when failure occurs for example,

in the video camera 1 installed in Home H, the user of Home H connects a video camera 1 to a home bus 6.

[0013] Consequently, predetermined data are delivered and received mutually, and between a video camera 1 and the failure judging equipment 5 of Center S, automatically, the cause of fault of a video camera 1 is specified, and components required for repair are arranged or it is made as [ adjust / business planning of the customer engineer which performs repair ].

[0014] Also when failure occurs to other household-electric-appliances devices (a personal computer 2, a television receiver 3, and refrigerator 4), the user of Home H connects to a home bus 6 the predetermined household-electric-appliances device which failure generated, and is made to make predetermined data similarly deliver and receive mutually between the failure judging equipment 5 of Center S, and a predetermined household-electric-appliances device. In addition, the household-electric-appliances device 3 by which the installation in Home H is not changed frequently, for example, TV television machine, the refrigerator 4, etc. may be beforehand connected to the home bus 6.

[0015] The image of a predetermined photographic subject is made as [ input / the lens 11 of a video camera 1 / into CCD camera 13 / through the equalization circuit 12 which changes the optical system ]. CCD camera 13 generates the video signal corresponding to the image of a photographic subject, and is made as [ supply / a digital disposal circuit 15 ].

[0016] A digital disposal circuit 15 performs predetermined signal processing to the video signal supplied from CCD camera 13, and is made as [ output / to recording devices, such as VCR (Video Cassette Recorder) which is not illustrated through an output circuit 16, ].

[0017] To various kinds of control 12 of a video camera 1, for example, an equalization circuit, a microcomputer 14 realizes optical system corresponding to a photographic subject, or is made as [ control / directing predetermined signal processing etc. ] to the digital disposal circuit 15. Moreover, actuation of the defect of a video camera 1 is detected, the failure analysis data for specifying a cause of fault are generated based on this detection result, and it is made as [ output / to a home bus 6 / through a digital disposal circuit 15 and the transceiver circuit 17 ]. Furthermore, electric fault finding inputted from a home bus 6 through the transceiver circuit 17 and a digital disposal circuit 15 is performed, consequently it is made as [ output / the failure judging data generated / to a home bus 6 / through a digital disposal circuit 15 and the transceiver circuit 17 ]. It is made as [ display / further again / on a liquid crystal display 18 / the

predetermined message or the failure information (information, such as the contents of failure, the repair approach, repair business time amount, and repair cost) which are inputted from a home bus 6 through the transceiver circuit 17 and a digital disposal circuit 15 ].

[0018] Through a home bus 6 and the telephone line 7, these data (failure analysis data, electric fault finding, failure judging data, a message, and failure information) are with a video camera 1 and the failure judging equipment 5 of Center S, and are made as [ receive / deliver and ].

[0019] It is received in the transceiver circuit 23 of failure judging equipment 5, and the failure analysis data or failure judging data transmitted from the video camera 1 is made as [ supply / the failure part judging circuit 22 ].

[0020] Failure part judging equipment 22 carries out analysis processing of failure analysis data or the failure judging data, and is made as [ supply / to the macro computer 24 / the result ].

[0021] The microcomputer 24 is made as [ display / on CRT21 / this analysis result ]. Moreover, according to an analysis result, the failure judging program for acquiring more detailed information is read from related information DB(database) 25, and it is made as [ transmit / to a video camera 1 ] through the macro computer 24, failure part judging equipment 22, the transceiver circuit 23, the telephone line 7, and a home bus 6. Furthermore, the failure information corresponding to the analysis result of the cause of fault supplied from the failure part judging circuit 22 is read out of the failure information accumulated in related information DB25, and it is made as [ transmit / to a video camera 1 ]. While performing stock control of components based on the analysis result of a cause of fault, it is made further again also as [ generate / business planning of the customer engineer which fixes ].

[0022] In addition, it is made as [ receive / predetermined failure analysis data, failure judging data, a failure judging program, a message, or failure information / deliver and ] between household-electric-appliances devices other than video camera 1 installed in Home H, and failure judging equipment 5 as well as the case of a video camera 1.

[0023] Moreover, as means of communications of Home H and Center S, it can also consider as cables, such as a fiber optic cable besides the telephone line. Moreover, it can also consider as wireless, such as a circuit for mobile communications.

[0024] Next, processing actuation of the cause-of-fault analysis system of drawing 1 is explained with reference to the flow chart of drawing 2 and drawing 3.

[0025] Now, failure should occur in the video camera 1 of drawing 1, and the user should connect the video camera 1 to the home bus 6. At this time, at step S1 of drawing

2, the microcomputer 14 of a video camera 1 detects the malfunction of a video camera 1, based on a detection result, generates the failure analysis data showing the condition of the malfunction which consists of discharge data of a predetermined control buffer etc., and transmits them to the failure judging equipment 5 of Center S through a digital disposal circuit 15, the transceiver circuit 17, a home bus 6, and the telephone line 7. It is received in the transceiver circuit 23 of failure judging equipment 5, and this failure analysis data is supplied to the failure part judging circuit 22. Then, failure analysis data are analyzed in the failure part judging circuit 22, and an analysis result is displayed on CRT21 through a microcomputer 24.

[0026] At continuing step S2, in order to acquire the more detailed information on a cause of fault, a microcomputer 24 reads the predetermined electric fault finding corresponding to the analysis result supplied from failure part judging equipment 22 accumulated in related information DB, and transmits it to a video camera 1. The transceiver circuit 17 of a video camera 1 receives electric fault finding, and supplies it to a microcomputer 14 through a digital disposal circuit 15. And a microcomputer 14 performs electric fault finding and generates failure judging data.

[0027] Then, a microcomputer 14 outputs failure judging data to a home bus 6 through a digital disposal circuit 15 and the transceiver circuit 17 at step S3. It is received through a home bus 6 and the telephone line 7 in the transceiver circuit 23 of failure judging equipment 5, and failure analysis data are supplied to the failure part judging circuit 22.

[0028] Next, by step S4, the failure part judging circuit 22 analyzes failure judging data, and supplies an analysis result to a microcomputer 24. And this analysis result is changed into the video signal which corresponds with a microcomputer 24, and is displayed on CRT21.

[0029] It judges whether at consecutive step S5, a microcomputer 24 can fix the household-electric-appliances device (video camera 1) which broke down based on an analysis result and the information accumulated in related information DB25. When judged [ that it is unfixable at step S5, and ], a microcomputer 24 transmits the predetermined message which shows that it cannot fix to a video camera 1 at step S6. It is received in the transceiver circuit 17 of a video camera 1, and this message is displayed on a liquid crystal display 18 through a digital disposal circuit 15 and a microcomputer 14.

[0030] Thus, the user of Home H can know whether it is that can fix failure of a video camera 1. In addition, at step S6, the message which added the explanation of a failure part besides a message or an easy cause of fault which shows that it cannot fix can also

be transmitted.

[0031] When judged [ that it is fixable at step S5, and ], it judges whether repair by the user is possible for a microcomputer 24 at step S7. When it is judged at step S7 that repair by the user is possible, at step S8, from related information DB25, a microcomputer 24 searches the corresponding repair approach and transmits it to a video camera 1. And this repair approach is displayed on the liquid crystal display 18 of a video camera 1.

[0032] Thus, the user of Home H can learn the repair approach, when failure of a video camera 1 can fix by itself.

[0033] When it is judged at step S7 that repair by the user is impossible, from related information DB25, a microcomputer 24 searches failure information, such as a repair cost and a repair time, with step S9, and transmits it to a video camera 1 by it. This failure information is displayed on the liquid crystal display 18 of a video camera 1. The user of Home H determines the repair volition of whether to fix with reference to the failure information displayed on the liquid crystal display 18, and transmits repair volition to failure judging equipment 5 by actuation of the predetermined ten key which it does not illustrate and carbon button which a video camera 1 possesses.

[0034] The information on repair volition is transmitted to failure judging equipment 5, and is expressed to CRT21 as continuing step S10.

[0035] At consecutive step S11, a microcomputer 24 judges whether it is that the user wishes to fix based on the information on the transmitted repair volition. When it is judged that he does not wish to fix, processing of the flow chart shown in drawing 2 is ended, but when it is judged that the user wishes to fix, subroutine processing (repair preliminary treatment) of step S12 is performed.

[0036] Here, the detail of processing of step S12 of drawing 2 is explained with reference to the flow chart of drawing 3.

[0037] At step S21 of drawing 3, based on the analysis result supplied from failure part judging equipment 22, a microcomputer 24 searches related information DB25, and determines predetermined components required for repair of a video camera 1.

[0038] It is judged whether at continuing step S22, there is any inventory of components required for repair. Although it branches to SUTTEU S27 when it is judged that there is an inventory of components required for repair, when it is judged that there is no inventory of components required for repair, a microcomputer 24 determines the quantity of the components (components required for repair) ordered from a parts center at step S23 according to a predetermined supply purchase plan.

[0039] And the order to a parts center is performed at step S24, and a microcomputer 24



updates an order part list at step S25 according to the contents of order. Then, if order components arrive at step S26, it will branch to step S27 and a microcomputer 24 will update a components inventory list at step S27.

[0040] Thus, according to a predetermined components purchase plan, an inventory of components required for repair is managed automatically.

[0041] A microcomputer 24 searches with consecutive step S28 the detailed failure correction activity attribute about repair of the class of failure, repair difficulty, the working hours that repair takes, components inventory information, components arrival of goods stage information, etc. from related information DB25.

[0042] Next, the repair time which repair takes for every customer engineer at step S29 based on the personnel information on the customer engineer accumulated in related information DB25 (information which each customer engineer has, such as a special technique and an activity rate) is presumed, and the optimal customer engineer for fixing a video camera 1 is elected based on business planning of the customer engineer accumulated in related information DB25 at step S30.

[0043] At continuing step S31, a microcomputer 24 updates business planning of the customer engineer elected at step S30.

[0044] Thus, termination of the repair preliminary treatment shown in the flow chart of drawing 3 fixes a predetermined household electric appliances device (video camera 1) using components required for the repair which branches to step S13 of drawing 2 and by which stock control of the elected customer engineer was carried out to it according to business planning.

[0045] Thus, while pinpointing in advance the failure part of the household electric appliances device which failure generated through a communication line and performing stock control of components required for repair, the optimal repair person in charge for the predetermined contents of repair can be elected.

[0046] Drawing 4 is the block diagram showing the configuration of other examples of the cause-of-fault analysis system adapting the repair dispatching equipment of this invention. In the cause-of-fault analysis system of drawing 4, the same sign is given to the case of drawing 1, and the corresponding part, and the explanation is omitted suitably.

[0047] The cause-of-fault analysis system shown in drawing 4 is an example of a configuration in case each household electric appliances device installed in the home H shown in drawing 1 does not have a transmitter style, and is the example to which only the troubleshooting communication device 32 was made to carry out the communication link with the failure judging equipment 5 installed in Center S.

[0048] Each household electric appliances device (31-1 thru/or 31-n) installed in Home H is made as [ connect / it can connect with a home bus 6 if needed, and / with the troubleshooting communication device 32 / it / through a home bus 6 ].

[0049] The microcomputer 41 of the household electric appliances device 31-1 detects actuation of the defect of the processing circuit 42 who performs essential actuation of the household electric appliances device 31-1, and is made as [ generate / based on this detection result / predetermined failure analysis data ] while performing various kinds of control of the household electric appliances device 31-1. Moreover, it is made as [ output / through a digital disposal circuit 43, the I/O circuit 44, and a home bus 6 / are inputted into a digital disposal circuit 43 through a home bus 6 and the I/O circuit 44, after downloading the electric fault finding to which processing predetermined by the digital disposal circuit 43 was performed, perform this / generate predetermined failure judging data or / from the troubleshooting communication device 32, / to the troubleshooting communication device 32 / failure analysis data or failure judging data ].

[0050] In addition, although illustration is omitted, other household electric appliances devices (31-2 thru/or 31-n) as well as the household electric appliances device 31-1 are constituted.

[0051] The microcomputer 51 of a troubleshooting communication circuit is inputted into a digital disposal circuit 52 through a home bus 6 and the I/O circuit 53. It gives the network address of failure judging equipment 5 to failure analysis data and the failure judging data with which processing predetermined by the digital disposal circuit 52 was performed, or performs the recovery corresponding to the telephone line 7, and is made as [ output / to failure judging equipment 5 / through a digital disposal circuit 52, the transmitter circuit 54, and the telephone line 7 ]. Moreover, it is made as [ transmit / the electric fault finding received through the telephone line 7, the transmitter circuit 54, and a digital disposal circuit 52 / to the predetermined household electric appliances device 31-1 thru/or 31-n / through a digital disposal circuit 52, the I/O circuit 53, and a home bus 6 ]. Furthermore, it is made as [ display / on CRT55 / the predetermined failure information or the predetermined message which are transmitted from failure judging equipment 5 ].

[0052] Since processing actuation of the cause-of-fault analysis system of drawing 4 is the processing shown in the flow chart of drawing 2 and drawing 3, and the same processing, the explanation is omitted.

[0053] In addition, although [ the troubleshooting communication device 32 ] it has only communication facility, it may be made to perform easy troubleshooting. In that case,

when failure occurs in the household-electric-appliances device 31-1 thru/or 31-n, from predetermined RAM which a microcomputer 61 has, easy electric fault finding is read, the predetermined household-electric-appliances device 31-1 thru/or 31-n are performed, the result (failure judging data) is analyzed, and an analysis result is transmitted to failure judging equipment 5. Then, the predetermined household-electric-appliances device 31-1 thru/or 31-n are made to transmit and perform electric fault finding for acquiring still more detailed failure judging data through the troubleshooting communication device 32 from failure judging equipment 5, and the activation result (failure judging data) is transmitted to failure judging equipment 5 through the troubleshooting communication device 32.

[00054] Thus, from the failure judging equipment 5 installed in Center S, transmit predetermined electric fault finding, and make it perform by the household-electric-appliances device 31-1 thru/or 31-n which failure generated, failure judging data are made to transmit to Center S further, and it analyzes, and stock control of components required for repair can be performed, or business planning of a customer engineer can be drawn up.

[00055] Therefore, since the customer engineer which fixes the broken household-electric-appliances device can know in advance the household-electric-appliances device 31-1 which failure generated thru/or the failure part of 31-n, it can use the already prepared components and can perform quick repair.

[00056] Moreover, since a predetermined customer engineer selects a person based on the contents of repair, and business planning of a customer engineer, the optimal customer engineer can perform repair by impossible business planning which is not.

[00057] Furthermore, since the stock control of components required for repair is made, it can be efficient and components required for repair can be made to reserve in Center S automatically based on a predetermined components purchase plan.

[00058] As the broken household-electric-appliances device 31-1 thru/or a diagnostic result of 31-n, since the time amount which repair cost and repair take can be transmitted with easy explanation of the contents of failure, a user can choose as a user whether it fixes with reference to this further again.

[00059] In addition, although [ the microcomputer 24 of failure judging equipment 5 ] stock control of components and business management of a customer engineer are performed automatically, the hitcher on of Center S may be made to direct these directions to a microcomputer 24 in an above-mentioned example if needed.

[00060]

[Effect of the Invention] According to repair dispatching equipment according to claim 1

and the repair dispatching approach according to claim 5, as mentioned above The electric fault finding for analyzing a cause of fault is transmitted through the predetermined communication line of a cable or wireless. Since it was made to arrange for receiving and analyzing the failure judging data generated by performing electric fault finding, specifying a cause of fault, and performing repair corresponding to a cause of fault Quick repair can be performed while the human rights expense which repair takes is reducible.

#### DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of one example of the cause-of-fault analysis system adapting the repair dispatching equipment of this invention.

[Drawing 2] It is a flow chart explaining processing actuation of the cause-of-fault analysis system of drawing 1.

[Drawing 3] It is a flow chart explaining the detail of subroutine processing of step S12 of drawing 2.

[Drawing 4] It is the block diagram showing the configuration of one example of other cause-of-fault analysis systems adapting the repair dispatching equipment of this invention.

[Description of Notations]

1 Video Camera 2 Personal Computer, 3 TV television machine Four refrigerators 6 failure judging equipment 6 A home bus, 7 Telephone line Eleven lenses 12 equalization circuit 13 A CCD camera, 14 Microcomputer 16 digital disposal circuit 16 An output circuit, 17 Transceiver circuit 18 liquid crystal displays, 21 CRT 22 A failure part judging circuit, 23 Transceiver circuit 24 A microcomputer, 26 Related information DB 31-1 thru/or 31-n household-electric-appliances device 32 A troubleshooting communication device, 41 Microcomputer 42 Processing circuit 43 Digital disposal circuit 44 I/O circuit 51 microcomputers 52 Digital disposal circuit 53 I/O circuits 54 transceiver circuits 55 CRT